

## **CLAIMS**

1. A switching amplifier controller comprising:

a switching output stage; and

a timing controller configured to control turn-on and turn-off switching transitions  
5 associated with the switching output stage such that dead time associated with the  
switching transitions is substantially eliminated and further such that turn -on delays are  
substantially identical to turn-off delays.

2. The switching amplifier controller according to Claim 1 wherein the switching  
10 output stage comprises an Hbridge having 4 power switches configured to drive a load  
in a bridge tied configuration.

3. The switching amplifier controller according to Claim 1 further comprising a  
shoot through detector configured to assist the timing controller resolve the turn -on and  
15 turn-off switching transitions such that shoot through is negated during the switching  
transitions.

4. The switching amplifier controller according to Claim 1 wherein the timing  
controller is an adaptive timing controller that operates in response to a shoot through  
20 feedback signal generated by the switching output stage such that shoot through is  
negated during the switching transitions.

5. The switching amplifier controller according to Claim 1 wherein the timing controller is further configured to prevent switching output stage shoot through during the switching transitions.

5        6. A switching amplifier controller comprising:

a switching output stage; and

an adaptive timing controller that operates in response to a shoot through feedback signal generated in response to switching output stage shoot through, to control turn -on and turn-off switching transitions associated with the switching output stage such that dead time associated with the switching transitions is substantially eliminated and further such that shoot through is negated during the switching transitions subsequent to a switching transition exhibiting shoot through.

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7. The switching amplifier controller according to Claim 6 wherein the switching output stage comprises an Hbridge having 4 power switches configured to drive a load in a bridge tied configuration.

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8. The switching amplifier controller according to Claim 6 wherein the adaptive timing controller is further operative to implement turn –on delays that are substantially identical to turn-off delays.

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9. A switching amplifier controller comprising:

a switching output stage comprising an Hbridge having 4 power switches configured to drive a load in a bridge tied configuration;

5 a shoot through detector operative to detect shoot through generated by the switching output stage and generate a shoot through signal in response thereto;

a shoot through encoder operative to generate a shoot through feedback signal in response to the shoot through signal;

an adaptation controller operative to generate adaptive control signals in response to the shoot through feedback signal;

10 a timing controller operative to generate a first set of timing control signals in response to a PWM input signal and the adaptive control signals;

a signal combiner operative to generate a second set of timing control signals in response to the first set of timing control signals; and

15 a plurality of power switch drivers operative to generate power switch turn-on signals and power switch turn-off signals in response to the second set of timing control signals to control power switch turn -on and turn-off switching transitions such that dead time associated with the switching transitions is substantially eliminated and further such that shoot through is negated during switching transitions subsequent to detection of shoot through via the shoot through detector.

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10. A switching amplifier controller comprising:

a switching output stage; and

means for controlling turn -on and turn -off switching transitions associated with the switching output stage in response to a shoot through feedback signal caused by

switching output stage shoot through, such that dead time associated with the switching transitions is substantially eliminated and further such that shoot through is negated during the switching transitions subsequent to a switching transition exhibiting shoot through.

5            11. The switching amplifier according to Claim 10 wherein the switching output stage comprises an Hbridge having 4 power switches configured to drive a load in a bridge tied configuration.

10            12. The switching amplifier according to Claim 11 wherein the means for controlling turn-on and turn-off switching transitions comprises:

             a shoot through detector operational to detect switching output stage shoot through and generate an output signal in response thereto; and

             an encoder operational to generate the shoot through feedback signal in response to the shoot through detector output signal.

15            13. The switching amplifier according to Claim 12 wherein the means for controlling turn-on and turn-off switching transitions further comprises:

             an adaptation controller operative to generate adaptive control signals in response to the shoot through feedback signal;

20            a timing controller operative to generate a first set of timing control signals in response to a PWM input signal and the adaptive control signals;

             a signal combiner operative to generate a second set of timing control signals in response to the first set of timing control signals; and

a plurality of switch drivers operative to generate switching output stage turn-on signals and switching output stage turn -off signals in response to the second set of timing control signals to control switch turn-on and turn-off switching transitions.

5           14. A method of controlling turn-on and turn-off switching transitions associated with a switching output stage, the method comprising the steps of:

          setting a high side turn -on delay and a low side turn -on delay to a desired maximum dead time;

          10       setting a high side turn-off delay and a low side turn -off delay to a desired minimum time period;

          monitoring the turn -on and turn -off switching transitions for shoot through;

          decreasing the desired maximum dead time by a predetermined amount in the absence of shoot through;

          15       increasing the low side turn -on delay by a predetermined amount in the presence of shoot through exclusively during a high to low switching transition;

          increasing the high side turn-on delay by a predetermined amount in the presence of shoot through desired maximum dead time by a predetermined amount in the presence of shoot through during both exclusively during a low to high switching transition; and

20           increasing the a high to low switching transition and a low to high switching transition.

          15. A switching circuit drive arrangement wherein switching devices are controlled by drive signal, said drive signals being applied to the devices from signal

processing circuitry having a digitally modulated drive input, signal processing circuitry being arranged to output said drive signals such that substantially said drive input is delivered to a load driven by said devices, wherein a detector circuit is compiled to said load to provide an output indicative of a switching parameter of said circuit and said  
5 output is fed back to said digital processing circuit, said digital processing circuit being further arranged to receive said output and to vary said drive signals to compensate for distortations of said drive input caused by said parameter.